

**Meeting of the Central Valley Flood Protection Board
September 23, 2011
Staff Report – Encroachment Permit
Tehama County Department of Public Works
Bowman Road Bridge at South Fork Cottonwood Creek in Tehama County**

1.0 – ITEM

Consider approval of Permit No. 18674

2.0 – APPLICANT

Tehama County Department of Public Works

3.0 – LOCATION

The project site is located along Bowman Road over the South Fork Cottonwood Creek, north of Red Bluff, in northern Tehama County, California. The approximate site coordinates are 40.316159 degrees north latitude, 122.449210 degrees west longitude (See Attachment A for Site Location Map).

4.0 – PROJECT DESCRIPTION

The Tehama County Department of Public Works in cooperation with the California Department of Transportation and Federal Highway Administration has proposed the Bowman Road Bridge Replacement Project over the South Fork Cottonwood Creek, north of Red Bluff, in northern Tehama County. The new bridge is 250 feet upstream of the proposed bridge. The project addresses public safety concerns associated with the existing seismically deficient bridge. The proposed bridge is 38.83-foot wide, 460-foot long, three-span, cast-in-place, prestressed concrete box girder bridge supported on single column bents. The project will also consist of placement of approximately 300 feet of rock slope protection.

5.0 – PROJECT ANALYSIS

The existing bridge is a steel truss bridge with concrete piers. Width of the existing bridge is 22 feet, and length is 200 feet. The existing bridge is on a critical 90 degree

bend. The proposed bridge creates a smooth crossing over Cottonwood Creek which enhances public safety.

The following project analyses have been made based on the review of the available technical information.

5.1 – Hydraulic Analysis

The Bowman Road bridge site at south fork Cottonwood Creek is within the regulated stream as per Table 8.1 of Title 23. The design flow for this stream is, however, not available; and with the absence of the designed flow, the 100-year flow was acceptable. Based on the Design Hydraulic Study prepared by the Pacific Hydrologic Incorporated, the estimated 100-year discharge at the bridge site was 32,600 cfs.

The HEC-RAS Program version 3.1.1 was used to model the hydraulic characteristics representing both the existing bridge condition (without project) and preferred bridge condition (with project). Stream cross-sections and the Manning's roughness coefficients upstream and downstream of the proposed bridge project were assumed constant for all the models. As per the Design Hydraulic Study, the cross-sections used in the models were from a recent ground survey. These cross sections were adjusted for skew as appropriate.

The 100-year discharge was used in the hydraulic models as a base flood. Manning's roughness coefficients for the channel and overbanks were estimated by observation and comparison with similar channels identified in roughness coefficients of natural channels and as described in Urban Surface Water Management. Manning's roughness coefficients of 0.032, 0.050 and 0.040 were used to represent the channel, left bank and right bank, respectively. Contraction and expansion coefficients of 0.1 and 0.3 respectively were used to represent the natural channel. These were raised to 0.3 and 0.5, respectively in the vicinity of the bridge site. The normal depth method was selected for estimating the downstream water surface elevation. A slope of 0.002, estimated from the slope of the stream channel, was used as the starting slope.

Five surveyed cross sections and one derived cross-section were used to isolate the effects of the downstream starting water surface elevation assumption from water surface elevations at the existing bridge. Automatically interpolated cross-sections were also inserted where necessary to improve the model performance. These cross-sections were checked to ensure no significant interpolation error.

Both existing bridge condition and proposed bridge condition were modeled. The existing bridge condition was modeled to identify and document the existing hydraulic conditions and to serve as a basis of comparison with which to evaluate the preferred bridge configurations. The proposed bridge condition was modeled to identify the hydraulic requirements and the impacts of the preferred bridge. The calculated 100-year water surface elevation (WSE) for the model with existing bridge condition was 532.24 feet. The calculated WSE for the proposed bridge was 530.81 feet. All elevations were in NAVD88, based on the staff's conversation with Kevin Rosser of Tehama County Public Works. Based on the above data, no hydraulic impact is anticipated.

Based on the hydraulic model as well as on the design submittal, the bottommost soffit elevation is 549.09 feet, and there is an 18.28 feet of freeboard.

Based on the Design Hydraulic Study, bank erosion is expected to occur along the South Fork Cottonwood Creek during large flood events. Bank erosion of the east approach of the existing bridge is also expected to occur during infrequent floods over time after removal of the existing bridge which will be mitigated by the rock riprap. Potential Pier scours have been estimated to be 15.2 feet at pier 2, and 16.6 feet at pier 3. Abutment 1 (west) is not subject to scour as this abutment is located well out of the 100-year floodplain. However, the Abutment 4 is subject to scour and the estimated scour is about 9.3 feet. The contraction scour associated with the new bridge is expected to be approximately 2 feet. No increased risk of damage to structures during infrequent floods is expected. Minor channel adjustment is expected within ½-mile upstream of existing bridge. No long term channel degradation affecting channel stability is expected.

5.2 – Geotechnical Analysis

Board staff has reviewed the geotechnical report for Bowman Road bridge replacement prepared by Taber Consultants. The local scour estimated by the Design Hydraulic Study was addressed in the bent design. Board staff finds no significant issues with the geotechnical report regarding the proposed bridge replacement at the South Fork Cottonwood Creek.

6.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with this project, from all pertinent agencies are shown below:

- A non-Fed letter from the U. S. Army Corps of Engineers (USACE) is expected for this project which will be incorporated in the permit as Exhibit A.

7.0 –CEQA ANALYSIS

Board staff has prepared the following CEQA findings:

The Board, as a responsible agency under CEQA, has reviewed Initial Study/Mitigated Negative Declaration (IS/MND, SCH Number: 2005062122, June 2005) and Mitigation Measures for the Bowman Road Bridge Replacement at South Fork Cottonwood Creek Project prepared by the lead agency, the Tehama County Department of Public Works. These documents, including project design, may be viewed or downloaded from the Central Valley Flood Protection Board website at <http://www.cvfpb.ca.gov/meetings/2011/9-23-2011.cfm> under a link for this agenda item. These documents are also available for review in hard copy at the Board and the Tehama County Department of Public Works.

The Tehama County Department of Public Works has determined that the project would not have a significant effect on the environment and the Tehama County Board of Supervisors adopted the IS/MND on August 16, 2005 and filed a Notice of Determination on August 17, 2005 with the State Clearinghouse and County Clerk. Board staff finds that although the proposed project could have a potentially significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. The project proponent has incorporated mandatory mitigation measures into the project plans to avoid identified impacts or to mitigate such impacts to a point where no significant impacts will occur. These mitigation measures are included in the project proponent's IS/MND and address impacts to cultural resources, hazards and hazardous materials, and biological resources.

8.0 – SECTION 8610.5 CONSIDERATIONS

1. Evidence that the Board admits into its record from any party, State or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

The Board will make its decision based on the evidence in the permit application and attachments, this staff report, and any other evidence presented by any individual or group.

2. The best available science that related to the scientific issues presented by the executive officer, legal counsel, the Department or other parties that raise credible scientific issues.

The accepted industry standards for the work proposed under this permit as regulated by Title 23 have been applied to the review of this permit.

3. Effects of the decision on the entire State Plan of Flood Control:

This project does not have significant impacts on the State Plan of Flood Control, as the project does not impair the structural or hydraulic functions of the system.

4. Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

Climate change issues have not been taken into account; however, it is assumed to be inland past the point tidal influence raises WSE. There are no other foreseeable projected future events that would impact this project.

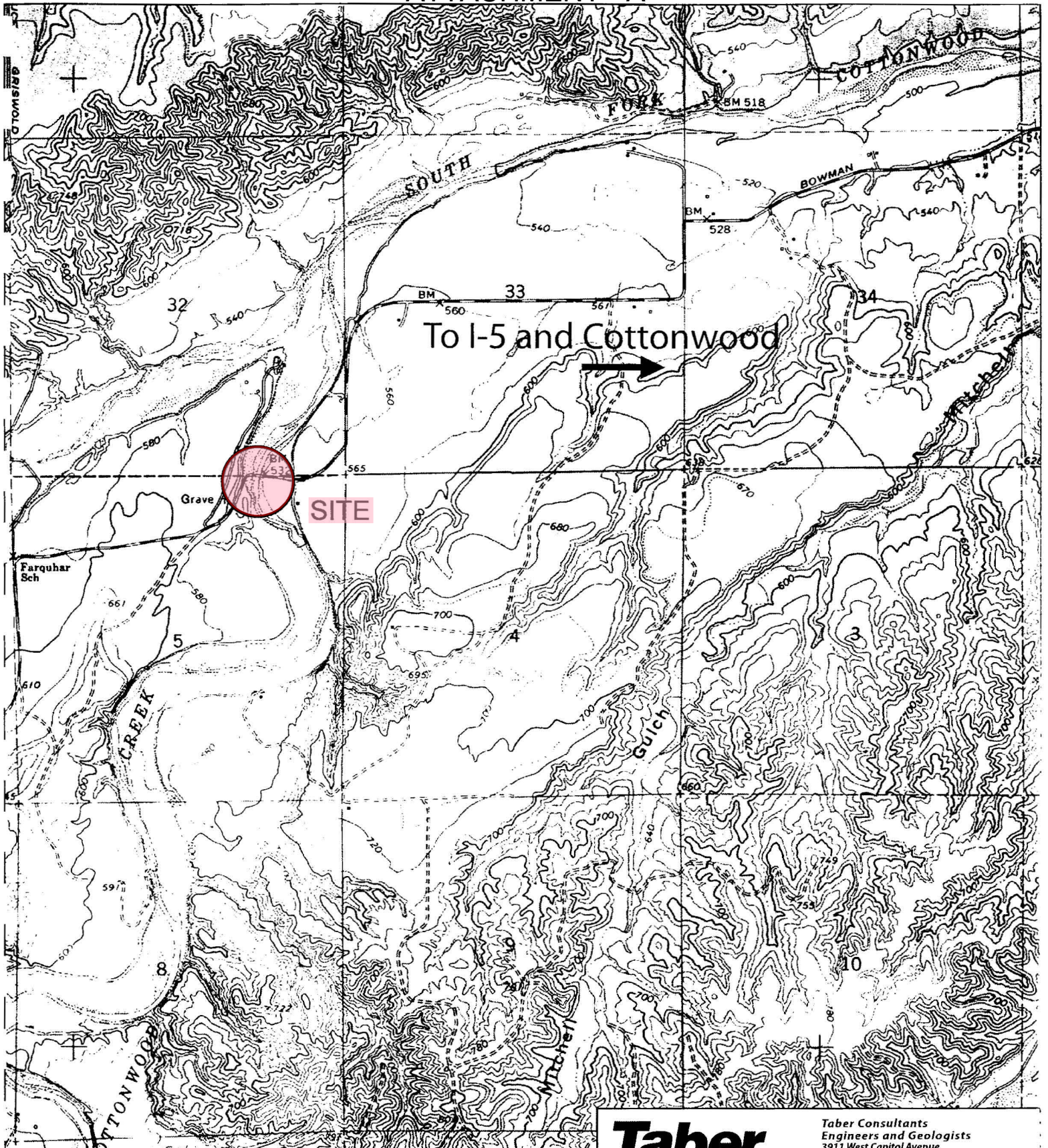
9.0 – STAFF RECOMMENDATION

Staff recommends that the Board adopt the CEQA Findings, approve Permit No. 18674, and direct the Executive Officer to take necessary actions to execute the permit and to file a Notice of Determination with the State Clearinghouse.

10.0 – LIST OF ATTACHMENTS

- A. Location Map
- B. Draft Permit No. 18674
- C. Typical Section

Reviewed by:	Deb Biswas, Ph.D., P.E.
Environmental Reviewed by:	Andrea Mauro, ES.
Final Reviewed by:	David R. Williams, P.E.
	Eric R. Butler, P. E.
	Len Marino, P.E.



Scale: 1:24,000

USGS "MITCHELL
GULCH" QUADRANGLE
7.5 MINUTE SERIES
(TOPOGRAPHIC), DATE
1965, REVISED 1976

Taber
Since 1954

*Taber Consultants
Engineers and Geologists
3911 West Capitol Avenue
West Sacramento, CA 95691-2116
916.371.1690 Fax 916.371.7265
www.taberconsultants.com*

Quincy Engineering, Inc.

Bowman Rd. Br. @ S.F. Cottonwood Crk
Tehama County, California

Vicinity Map

1P2/399/142-3	Figure-1
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STATE OF CALIFORNIA
THE RESOURCES AGENCY
THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18674 BD

This Permit is issued to:

Tehama County Public Works
9380 San Benito Avenue
Gerber, California 96035

To remove the existing Bowman Road / South Fork Cottonwood Creek bridge and replace it with a 38.83-foot-wide, 460-foot-long, three-span, cast-in-place, prestressed concrete box girder bridge supported on single column bents. Approximately 300 feet of rock slope protection will be placed within South Fork Cottonwood Creek as part of this project. Bowman Road at the South Fork of Cottonwood Creek, north of Red Bluff, in northern Tehama County (Section 32, 35, T28/29, R5E, MDB&M, Cottonwood Creek, Tehama County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection

ATTACHMENT - B

Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18674 BD

THIRTEEN: All work approved by this permit shall be in accordance with the submitted drawings and specifications except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Central Valley Flood Protection Board.

FOURTEEN: The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

FIFTEEN: The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages related to the Central Valley Flood Protection Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

SIXTEEN: The mitigation measures approved by the CEQA lead agency and the permittee are found in the Final Initial Study/Mitigated Negative Declaration adopted by the CEQA lead agency. The permittee shall implement all such mitigation measures.

SEVENTEEN: The Central Valley Flood Protection Board and Department of Water Resources shall

ATTACHMENT - B

not be held liable for damages to the permitted encroachment(s) resulting from releases of water from reservoirs, flood fight, operation, maintenance, inspection, or emergency repair.

EIGHTEEN: No construction work of any kind shall be done during the flood season from November 1 to April 15 without prior approval of the Central Valley Flood Protection Board.

NINETEEN: The permittee shall maintain the permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of the Department of Water Resources or any other agency responsible for maintenance.

TWENTY: The permittee shall contact the Department of Water Resources by telephone, (916) 574-1206, and submit the enclosed postcard to schedule a preconstruction conference. Failure to do so at least 10 working days prior to start of work may result in delay of the project.

TWENTY-ONE: Temporary staging, formwork, stockpiled material, equipment, and temporary buildings shall not remain in the floodway during the flood season from November 1 to April 15.

TWENTY-TWO: Prior to start of any demolition and/or construction activities within the floodway, the applicant shall provide the Central Valley Flood Protection Board with two sets of layout plans for any and all temporary, in channel cofferdam(s), gravel work pad(s), work trestle(s), scaffolding, piles, and/or other appurtenances that are to remain in the floodway during the flood season from November 1 through April 15.

TWENTY-THREE: Debris that may accumulate on the permitted encroachment(s) and related facilities shall be cleared off and disposed of outside the floodway after each period of high water.

TWENTY-FOUR: All debris generated by this project shall be disposed of outside the floodway.

TWENTY-FIVE: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1 to April 15.

TWENTY-SIX: Fill material shall be placed only within the area indicated on the approved plans.

TWENTY-SEVEN: Backfill material for excavations shall be placed in 4- to 6-inch layers and compacted to at least the density of the adjacent, firm, undisturbed material.

TWENTY-EIGHT: Density tests by a certified materials laboratory will be required to verify compaction of backfill within the regulated channel.

TWENTY-NINE: Except with respect to activities expressly allowed under this permit, the work area shall be restored to the condition that existed prior to start of work.

THIRTY: The permittee shall provide supervision and inspection services acceptable to the Central Valley Flood Protection Board.

THIRTY-ONE: The permittee shall submit as-built drawings to the Department of Water Resources' Flood Project Inspection Section upon completion of the project.

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THIRTY-TWO: In the event that levee or bank erosion injurious to the adopted plan of flood control occurs at or adjacent to the permitted encroachment(s), the permittee shall repair the eroded area and propose measures, to be approved by the Central Valley Flood Protection Board, to prevent further erosion.

THIRTY-THREE: The permitted encroachment(s) shall not interfere with operation and maintenance of the present or future flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not comply, the Central Valley Flood Protection Board may modify or remove the encroachment(s) at the permittee's expense.

THIRTY-FOUR: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project under direction of the Central Valley Flood Protection Board and Department of Water Resources, at the permittee's or successor's cost and expense.

THIRTY-FIVE: The permittee shall be responsible for securing any necessary permits incidental to habitat manipulation and restoration work completed in the flood control project, and will provide any biological surveying, monitoring, and reporting needed to satisfy those permits.

THIRTY-SIX: The permittee should contact the U.S. Army Corps of Engineers, Sacramento District, Regulatory Branch, 1325 J Street, Sacramento, California 95814, telephone (916) 557-5250, as compliance with Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act may be required.

THIRTY-SEVEN: The abandoned or dismantled bridge shall be completely removed and disposed of outside the limits of the levee section and floodway.

THIRTY-EIGHT: Piers, bents, and abutments being dismantled shall be removed to at least 1 foot below the natural ground line and at least 3 feet below the bottom of the low-water channel.

THIRTY-NINE: The bridge piers and bents shall be constructed parallel to the direction of streamflow.

FORTY: Drainage from the bridge shall not be discharged into the streambank.

FORTY-ONE: Plans showing all construction facilities such as temporary staging, coffer dams, and falsework which shall remain in a floodway during November 1 to April 15, must be submitted to the board for approval prior to installation of these facilities.

FORTY-TWO: All construction facilities such as temporary staging, coffer dams, and falsework must be designed to prevent bank erosion during normal streamflows and maintain maximum channel capacity during November 1 to April 15.

FORTY-THREE: The soffit of the bridge shall be no lower than that of the replaced bridge.

FORTY-FOUR: Bridge piers and bents placed within the channel to support the bridge shall be

ATTACHMENT - B

constructed in line with the existing bents and piers.

FORTY-FIVE: Revetment shall be quarry stone or cobbles and shall meet the following grading:

Quarry Stone		Cobbles	
Stone Size	Percent Passing	Stone Size	Percent Passing
15 inches;	100	15 inches;	100
8 inches;	80-95	10 inches;	55-95
6 inches;	45-80	8 inches;	35-65
4 inches;	15-45	6 inches;	10-35
2 inches;	0-15	3 inches;	1-5

FORTY-SIX: The revetment shall not contain any reinforcing steel, floatable, or objectionable material. Asphalt or other petroleum-based products may not be used as fill or erosion protection on the levee section or within the floodway.

ATTACHMENT C - TYPICAL SECTION INDEX TO PLANS

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
02	Teh	CR		25	40

PRVC 36+00.00
Elev 574.01

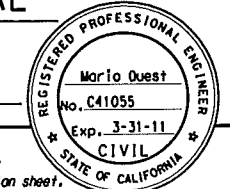
EVC 46+80.00
Elev 556.42

1080.00' VC
R/C = 0.556% per Sta

Sheet No.	Title
1	General Plan
2	Deck Contours
3	Foundation Plan
4	Abutment Layout
5	Abutment Details No. 1
6	Abutment Details No. 2
7	Pier Layout
8	Pier Details
9	Typical Section
10	Girder Layout
11	Girder Reinforcement
12	Tubular Bicycle Railing
13	Structure Approach Type EQ(10)
14	Joint Seal Assembly (Maximum MR=4")
15	Log of Test Borings No. 1
16	Log of Test Borings No. 2

100% SUBMITTAL

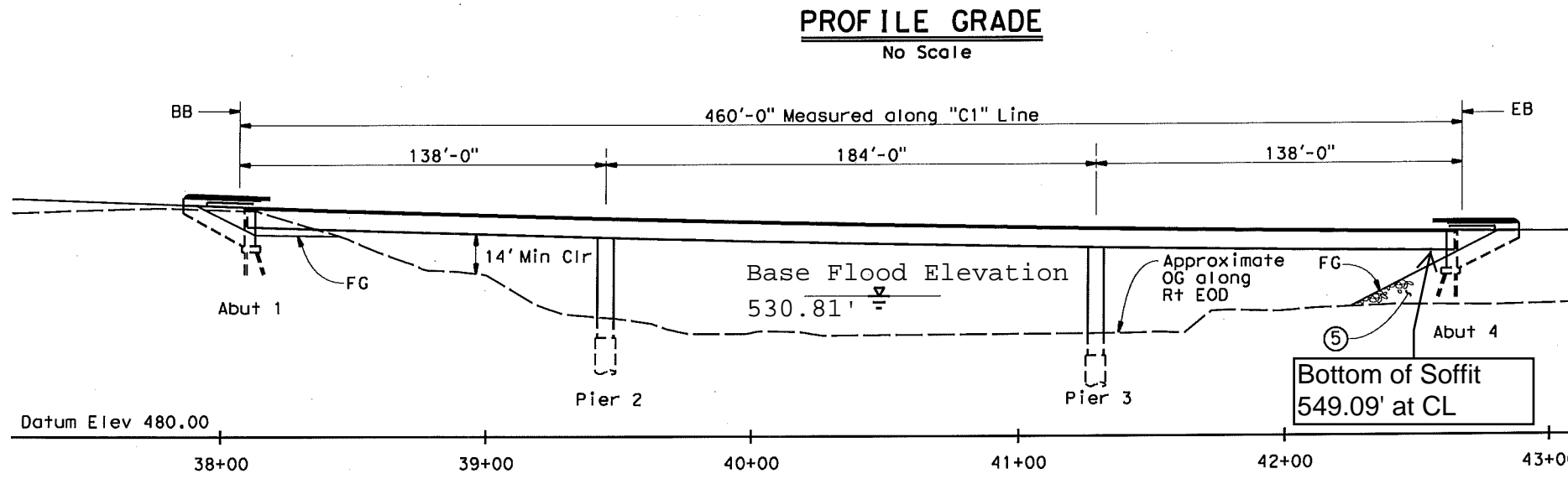
REGISTERED CIVIL ENGINEER



PLANS APPROVAL DATE

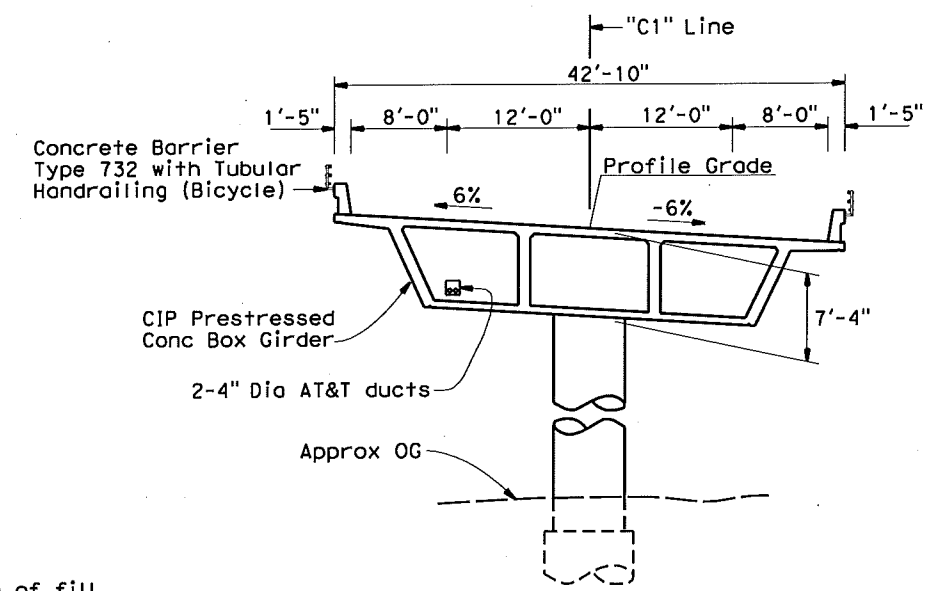
The County or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

QUINCY ENGINEERING, INC
3247 Ramos Circle
Sacramento, CA 95827 - 2501

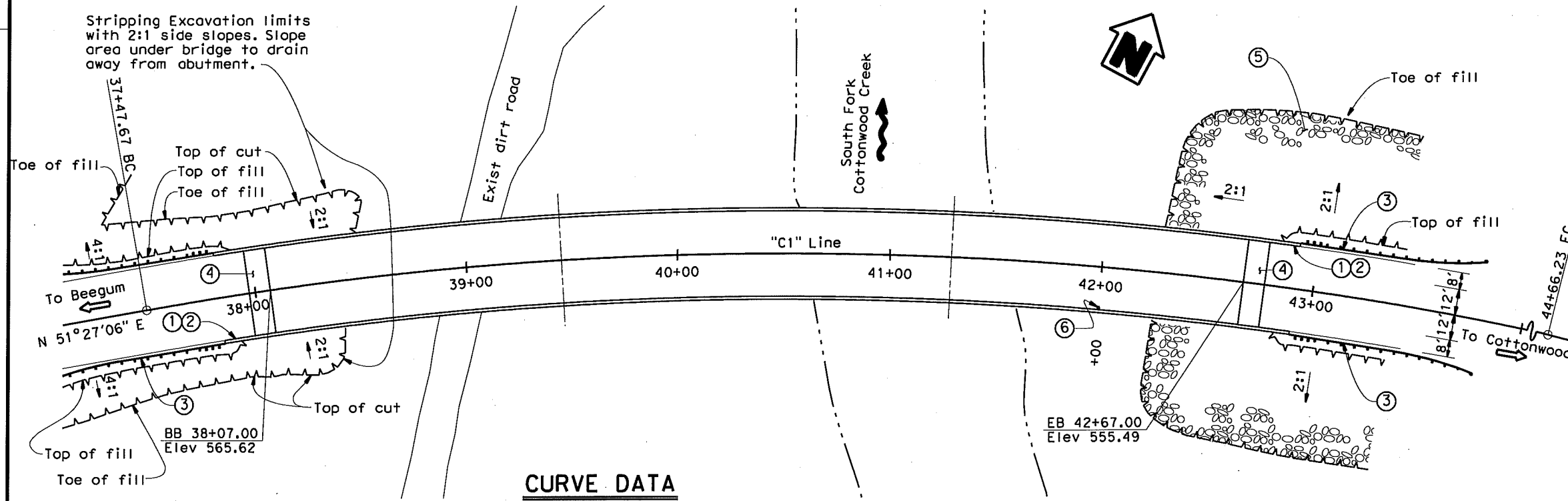


PROFILE GRADE
No Scale

ELEVATION
1"=30'



TYPICAL SECTION
1/8"=1'-0"



CURVE DATA

R = 1680'
Δ = 24°30'23"
T = 364.86'
L = 718.56'

PLAN
1"=30'

Legend:

- ① Paint "Br. No. 08C-0368"
- ② Paint "Bowman Road Bridge at S.F. Cottonwood Creek"
- ③ MBGR see "Road Plans"
- ④ Structure Approach Type EQ(10)
- ⑤ Rock Slope Protection, see "Road Plans"
- ⑥ Deck Drain Type D-2 (Modified), see "Girder Reinforcement" sheet

For General Notes and Quantities see "Deck Contours" sheet

For Hydrologic Summary, see "Foundation Plan" sheet

DESIGN OVERSIGHT	DESIGN BY	M. Quest/M. Ruble	CHECKED	L. Mason	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD	PREPARED FOR THE COUNTY OF TEHAMA DEPARTMENT OF TRANSPORTATION	BRIDGE NO.	08C-0368	Bowman Rd.Br.@ S.F.Cottonwood Crk GENERAL PLAN	
	DETAILS BY	J. Bland	CHECKED	L. Mason	LAYOUT BY	M. Quest		CHECKED	L. Mason		POST MILES
SIGN OFF DATE	QUANTITIES BY	M. Ruble	CHECKED	E. Dahl	SPECIFICATIONS BY	K. Gallagher	PLANS AND SPECS COMPILED	I. Osterkamp			
DESIGN GENERAL PLAN SHEET (ENGLISH) (REV.5/9/00)								ORIGINAL SCALE IN INCHES FOR REDUCED PLANS	0 1 2 3	DISREGARD PRINTS BEARING EARLIER REVISION DATES	
								CU EA	REVISION DATES (PRELIMINARY STAGE ONLY)		SHEET OF 1 16

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